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PSYCHOLOGICAL LITERATURE.

I.—HISTOLOGY OF THE NERVOUS SYSTEM.

The Structure and Combination of the Histological Elements of the Central Nervous System. FRIDTJOF NANSEN. Bergens Museums Aarsberetning for 1886.

This paper of nearly two hundred pages is in English and contains the author's views of the minute structure of nerve cells and fibres, chiefly in invertebrates. There are eleven plates. From the study of species of mollusks, Chaetopodes, Oligochaetes, Crustaceans, Ascidians, and the two low vertebrates, Amphioxus and Myxine, he states the following: All nerve fibres, or nerve tubes, as Nansen prefers to call them, contain one or more primitive tubules. Under certain circumstances these nerve fibres have been described as containing fibrillae floating in a liquid contained by the sheath of the fibre. The author rejects this view and presents his evidence for one which differs from it. According to the view given, the nerve fibre is a tube. The subdivisions within the fibre are the "primitive tubules," and these contain the "hyaloplasm" which is the true nervous substance. The primitive tubules are the meshes in a supporting substance designated as "spongioplasm," a substance described as similar to the neuroglia which forms the sheath of the nerve tube or fibre. We have then within the nerve tube the primitive tubules, the wall of each tubule being formed by this spongioplasm.

In the study of the cell, Nansen finds that one principal constituent of the protoplasm of the cell is the primitive tubules, which have there the same structure that they have in the nerve tubes. The course of these primitive tubules within the cell is but partially made out, but they can be seen at times to run in circles about the nucleus, and thus give to the cell the concentrically striated appearance which has often been described. Beside this there is a spongioplasmic reticulation in the cell body, so that the hyaloplasm filling these reticulations and that in the primitive tubules go to make up the protoplasm of the cell.

Regarding the nature of the cell processes, Nansen follows Golgi in every particular. All the processes save one are protoplasmic, and these have probably a nutritive function. The remaining prolongation, the axis cylinder process, is always branched and belongs to one of two types: that where the identity of the axis cylinder is almost at once lost by profuse branching, or that in which it gives off branches but at the same time maintains its identity and passes to the periphery.

The author next proceeds to the examination of the dotted substance of Leydig. He concludes that it is formed of tubes and fibrillae which do not anastomose with each other, but form a close web or plaiting. The term fibrillae is used in this case to designate very fine

primitive tubules and also fine prolongations of neuroglia substance. The meshes of the dotted substance, as described by other authors, are only the transected sheaths of the tubules, and the inter-fibrillar substance is hyaloplasm, the true nervous substance filling the tubes.

Lastly the author gives a scheme for the course of an impulse in a reflex action. The impulse starting from the periphery passes by the cell on the posterior root ganglion, and enters one of the branches into which the sensory fibre divides in the cord. These branches of the entering fibre are assumed to be in connection with at least the branches from the two sorts of cells which, according to Golgi's classification, are there present. Nansen gives reasons for thinking that the impulse does not enter the sensory cell of Golgi. The entering branches being, however, connected with the branches of the motor cells, it is assumed that the impulse travels from the sensory network through the lateral branches of the axis cylinder prolongation of the motor cells. At this point two courses are again open to it. It may either pass up into the motor cell or out along the prolongation. Nansen thinks that the latter course may be the one taken. As is plain, this view relieves the cells from any direct connection with such an impulse. The role suggested for the cells thus thrown out of employment is that of nutritive centres.

The investigation represents much careful study, as far as the histology is concerned, though the presentation could have been condensed with advantage. Against the speculations at the end of the paper there is certainly some positive evidence from the peculiar irritability of nerve cells as compared with that of other elements of the nerve centres. On the other hand, the hypothesis needs for its support either the assumption that the tubules or fibrillae form T branches in the neighborhood of the cell, or else that the conduction in the fibrillae or tubules is not isolated; and so far as known, there are no histological facts which favor either of these assumptions.

Das zentrale Nervensystem der Acephalen. B. RAWITZ. Jenaische Zeitschr. für Naturwissenschaft, B. 20 (N. F. B. XIII), H. 2 und 3, 1887, pp. 385-460. 21 Tafeln.

The author studies the nervous system in the Acephala with the main view of getting a better means for classification within the group. The result of his investigation is to place the Ostreacea at the head of the group because of the highly differentiated visceral ganglion which it possesses. On the way the paper touches many points in comparative neurology. Regarding the form of the ganglion cells, R. is a vigorous supporter of the unipolar cells. The connection of this cell with others may be considered to take place through the network into which the single nervous prolongation is considered to break up. Other cells are described which have only protoplasmic prolongations. Cells are figured as uniting with one another by these latter.

The principal prolongation, where it exists, is considered as the homologue of the axis cylinder or Deiters prolongation, and is described as passing toward the centre of the ganglion. In a few cases the prolongation passes on to a nerve, but in the majority it breaks up into a network in the centre of the ganglion, and from this network the fibres arise. The fibres are simply groups of axis cylinders separated by a homogeneous medium and enclosed in a connective tissue sheath. A ganglion consists of several layers of cells surrounding a